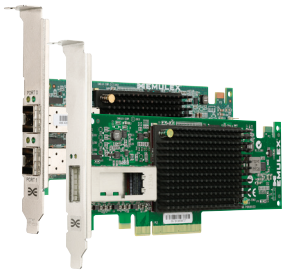

OneConnect OCe14000 Family

OCe14000 10Gb and 40Gb Ethernet Network Adapters

High Performance Networking for Enterprise Virtualization and the Cloud

Overview

As the fourth generation of the Emulex OneConnect® product line, the OCe14000 family of Ethernet network adapters provides high performance 10Gb Ethernet (10GbE) and 40GbE connectivity delivering multiple benefits for the enterprise cloud, including:

- Increasing data center IT agility and scalability through deployment of a secure multi-tenant cloud
- Optimizing server hardware utilization by scaling high density virtualization
- Delivering user-controlled bandwidth partitioning across workloads and management services

The OCe14000 family of 10Gb and 40Gb Ethernet network adapters is designed for the high bandwidth and scalability demands of enterprise applications, more scalable virtualization with support for enhanced Single-Root I/O Virtualization (SR-IOV) and NIC port partitioning, and next-generation Virtual Network Fabric (VNF) networking technologies that address the requirements virtual machine (VM) mobility and massive scaling of Layer 2 subnets inside private or hybrid cloud infrastructures.

Emulex Virtual Network Exceleration (VNeX™) Virtual Network Fabric Offloads for Multi-Tenant Cloud Networking

Scaling existing technologies for private or public multi-tenant infrastructures requires networking solutions that can enable VM-to-VM communication and virtual workload migration across Layer2 and Layer 3 boundaries without impacting connectivity or performance.

At the same time, these solutions need to ensure isolation and security for thousands or millions of tenant networks. However, with existing technology, the available 4094 VLAN IDs are insufficient to isolate/secure each tenant in a data center (private cloud) or hybrid cloud environment.

VMware's Virtual Extensible Local Area Network (VXLAN) and Microsoft's Network Virtualization using Generic Routing Encapsulation (NVGRE) are next-generation VNF overlay networking solutions that address these requirements. VNF solutions are a MAC-in-IP data packet encapsulation scheme enabling the creation of virtualized Layer 2 subnets that can span physical L3 IP networks. Traffic from each VM is mapped to a specific virtual network; the packets are then routed transparently over the existing physical infrastructure.

Emulex VNeX offload technology powered by a multi-core adapter ASIC engine accelerates the performance of network virtualization by offloading the header encapsulation process, while simultaneously preserving legacy stateless TCP offloads, providing full native network performance in a virtual network environment.

Key Benefits

- Maximizes server hardware ROI with high virtual machine density
- Simplifies deployment of secure, scalable multi-tenant cloud infrastructures
- Accelerates applications performance
- Provides the bandwidth needed for slot constrained server platforms
- Reduces complexity through the deployment of a common network platform
- Reduces management and infrastructure costs

OneConnect®

OneCommand®

OCe14000 10Gb and 40Gb Ethernet Network Adapters

Optimized Host Virtualization Density with SR-IOV Support

SR-IOV optimizes I/O for VMs, enabling higher host server virtualization ratios to deliver maximum server ROI. SR-IOV provides a more cost-effective solution than multiple, physical adapter ports. SR-IOV enables multiple VMs to directly access the OCe14000's I/O resources, thus allowing VM networking I/O to bypass the host and take a path directly between the VM and the adapter, eliminating redundant I/O processing in the hypervisor. This, in turn, allows higher I/O performance and lower CPU utilization as compared to the alternative of software-emulated NIC devices that are implemented in the hypervisor.

Optimized Bandwidth Allocation with Emulex Universal Multi-Channel Port Partitioning

Emulex Universal Multi-Channel (UMC) allows multiple PCI functions to be created on each adapter port. As a network adapter, each port on the OCe14000 can be configured with up to four NIC functions, for a total of eight NIC functions on a two-port adapter. UMC is ideal for virtualized server environments because bandwidth allocation can be optimized to support virtual machine migration, management and I/O intensive applications.

Simplified Management OneCommand® Manager Application

The OneCommand Manager application provides centralized management of Emulex OneConnect UCNAs and LightPulse® HBAs throughout the data center from a single management console. The OneCommand Manager application provides a graphical user interface (GUI) and a scriptable command line user interface (CLI). OneCommand Manager for VMware is fully integrated with VMware vCenter to simplify management for virtual server deployments.

Fourth Generation Platform delivers Enterprise-Class Reliability & Performance

Leveraging generations of advanced, field-proven controller and adapter technology, OCe14000 adapters meet the robust interoperability and reliability requirements of enterprise and scale-out data centers.

Key Features

- Superior network scalability—10GbE or 40GbE bandwidth on common software platform
- SR-IOV
- Powerful hardware offload for:
  - Virtual Network Fabrics (NVGRE and VXLAN)
  - Stateless TCP
- Greater bandwidth with PCIe 3.0
- VMware vSphere NetQueue support
- Microsoft Windows Server VMQ and Dynamic VMQ support

OCe14000 10Gb and 40Gb Ethernet Network Adapters

Controller

- Emulex Engine, XE100 series controllers

Ethernet Standards

- Single IEEE 802.3ba 40GBASE Ethernet port (40GBASE-SR4/40GBASE-CR4)
- Single or Dual IEEE 802.3-2008 10GBASE Ethernet ports (10GBASE-SR/10GBASE-LR/10GBASE-CR)
- IEEE 802.1Q virtual LANs (VLAN)
- IEEE 802.3x Flow control with Pause frames
- IEEE 802.1Qbg Edge Virtual Bridging
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS); Data Center Bridging Capability Exchange (DCBX)
- IEEE 802.1Qbb Priority Flow Control (PFC)
- IEEE 802.3ad Link Aggregation/LACP
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)

Ethernet Network Interface (Layer 2 NIC) and TCP/IP

- NDIS 5.2, 6.0, 6.2, 6.3-compliant Ethernet functionality
- IPv4/IPv6 TCP, UDP checksum offload
- IPv4/IPv6 Receive Side Scaling (RSS)
- IPv4/IPv6 Large Receive Offload (LRO)
- IPv4/IPv6 Large Send Offload (LSO)
- Dynamic VMQ (Windows Server 2012 Hyper-V) and NetQueue (VMware vSphere)
- Programmable MAC and VLAN addresses
- 128 MAC/VLAN addresses per port
- Support for hash-based Multicast MAC address filters
- Support for hash-based Broadcast frame filters per port
- VLAN offloads (insertion and extraction)
- Jumbo frame support up to 9200 Bytes

I/O Virtualization

- Stateless L2, L3, and L4 offloads for frame-in-frame encapsulation (VXLAN, NVGRE)
- PCI-SIG Address Translation Service (ATS) v1.0
- Support for up to 512 hardware queues
- Virtual Switch Port Mirroring for diagnostic purposes
- Virtual Ethernet Bridging (VEB)
- OneConnect Universal Multi-Channel™ (UMC), support for 4 NIC partitions or functions per physical port
- NIC SR-IOV:
  - For 1x10G and 1x40G: up to 63 VFs per port
  - For 2x10G: up to 31 VFs per port
- QoS for controlling and monitoring bandwidth assigned to and used by virtual entities
- Configurable control of network bandwidth by physical port, queue, or protocol
- Traffic shaping and QoS across each VF and PF

Converged Enhanced Ethernet (CEE) and Datacenter Bridging (DCB)

- IEEE 802.1Qbb Priority Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.1Qaz Data Center Bridging Exchange (DCBX)
- Absolute per-priority rate control option/ configuration

PCI Express (PCIe) Interface

- PCIe Gen 3.0 x8 (8, 5.0, and 2.5 GT/s per lane) compliant interface:
  - Up to 64 Gb/s full duplex bandwidth
  - Configurable width and speed to optimize power versus bandwidth
- Support for up to 8 PCIe physical functions (PFs)
- Support for x1, x2, x4, and x8 links widths
- Single Root I/O Virtualization (SR-IOV)
  - For 1x10G and 1x40G: up to 63 virtual functions (VFs) per port
  - For 2x10G: up to 31 VFs per port
- Message Signal Interrupts (MSI-X)
- Advanced Error Reporting (AER)
- Support for D0 and D3 (hot and cold) power management modes
- Completion Timeout (CTO)
- Function Level Reset (FLR)

Comprehensive OS Support

- Windows Server
- Red Hat Enterprise Linux
- SUSE® Linux Enterprise Server
- Oracle Linux
- VMware vSphere
- CentOS
- Debian
- Ubuntu
- FreeBSD

Management, Boot Support

- vCenter management plugin support
- Role-based management, integrated with Active Directory and LDAP
- Multi-channel configuration and bandwidth control
- UEFI and x86 remote boot support including PXE v2.1, UEFI 2.3.1
- Offline and online firmware updates
- Integrated Thermal Sensor works with management utilities

Hardware Environments

- x86, x64 servers

Please refer to the product page on www.emulex.com for further details.

OCe14000 10Gb and 40Gb Ethernet Network Adapters

Interconnect

Copper
- SFP+ Direct Attached Twin-Ax Copper interface
- Standards compliant passive copper cables up to 5m and active copper cables up to 10m

Optical
- Optic 10GBASE-SR short wave lasers with LC type connector supported up to 300m on laser-optimized OM3 multimode fiber (MMF) cables
- Optic 40GBASE-SR4 short wave lasers with MPO type connector supported up to 100m for OM3 and 150m for OM4 respectively on MMF cables
- Optic 10GBASE-LR long wave lasers with LC type connector supported up to 10Km single mode fiber (SMF) cable, Ethernet use only

Physical Dimensions

- Short, low profile MD2 form factor card
- 167.64mm x 68.91mm (6.60" x 2.71")
- Standard bracket installed (low-profile bracket available)

Environmental Requirements

- Operating temperature: 0° to 55°C (32° to 131°F)
- Storage temperature: -40° to 70°C (-40° to 158°F)
- Relative humidity: 5% to 95% non-condensing

Agency and Product Safety Approvals

North America
- FCC/Industry Canada Class A
- UL/CSA Recognized
- Class 1 Laser Product per DHHS 21CFR (J)

Europe
- CE Mark
- EU RoHS compliant
- TUV Bauart Certified
- Class 1 Laser Product per EN60825-1

Australia
- C-Tick Mark

Japan
- VCCI Class A

Taiwan
- BSMI Class A

Korea
- MSIP (formally KCC/MIC) Class A

China
- China RoHS Compliant

Ordering Information

Adapters

OCe14101-NX
- Single-channel, 10GBASE-CR (direct attach copper) SFP+, Ethernet Network Adapter

OCe14101-NM
- Single-channel, 10GBASE-SR (short reach optical) SFP+, Ethernet Network Adapter, Optics included

OCe14102-NX
- Dual-channel, 10GBASE-CR (direct attach copper) SFP+, Ethernet Network Adapter

OCe14102-NM
- Dual-channel, 10GBASE-SR (short reach optical) SFP+, Ethernet Network Adapter, Optics included

OCe14401-NX
- Single-channel, 40GBASE-CR4 (direct attach copper) QSFP+, Ethernet Network Adapter

Optional Accessories*

OC10-SR-OPT-1
- 10GBASE-SR (short reach optical) SFP+ Optical Kit, 1 pc

OC10-SR-OPT-2
- 10GBASE-SR (short reach optical) SFP+ Optical Kit, 2 pcs

OC10-LR-OPT-1
- 10GBASE-LR (long reach optical) SFP+ Optical Kit, 1 pc, for Ethernet use only

OC40-SR4-OPT-1
- 40GBASE-SR4 (short reach optical) QSFP+ Optical Kit, 1pc

* Only Emulex Accessories are warranted and fully supported by Technical Support

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